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FEASIBILITY OF EXPORTING WATERMELONS TO ENGLAND

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FEASIBILITY OF EXPORTING WATERMELONS TO ENGLAND

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INTRODUCTION

Exports of agricultural products are of major importance to U.S. agriculture and the U.S. balance of international payments. In the 1970-71 fiscal year, exports represented 8 and 16.6 percent of total cash receipts for vegetables and fruits in the United States.^{1/}

In an attempt to develop a potential export market for watermelons, a cooperative research project was initiated by Foreign Agricultural Service and by the Agricultural Research Service of the U.S. Department of Agriculture.

The objectives of the study were:

1. To conduct an integrated marketing program for U.S. watermelons and to determine:

- a. Will the melons sell at a price that will give a reasonable return to producer, importer, and retailer?
- b. What is the consumer reaction to watermelons in terms of price and taste?

2. To determine the overall costs of transporting and marketing U.S. watermelons to markets in England.

3. To evaluate the performance of a forced-air ventilation (unrefrigerated) system with a refrigerated system on van containers for export of watermelons.

4. To evaluate the use of selected corrugated fiberboard boxes for export of watermelons.

The purpose of this report is to alert shippers to the possibility of exporting watermelons, as well as to problems they may encounter. The report is a case study of the results of three shipments made in 1971.

^{1/} Lemon, Isaac E. State and Regional Sources of Record 1971 U.S. Farm Exports. Foreign Agriculture, Nov. 1, 1971.

DESCRIPTION OF TESTS

The Florida Watermelon Growers and Distributors Association and the National Watermelon Growers and Distributors Association cooperated in supplying a load of watermelons and point-of-purchase promotion materials. The association found a watermelon grower and shipper who was interested in exporting the initial shipments. Foreign Agricultural Service and Agricultural Research Service found an interested broker and chainstore receiver in England. Agricultural Research Service supplied the packaging and transport technology. Foreign Agricultural Service guaranteed the ocean freight on the initial shipment and supplied in-store demonstrators to slice the watermelons and to distribute samples to store customers.

Three separate van container shipments of watermelons were made from Florida to England in May and June 1971. One of the van containers was a forced-air, ventilated container, and the other two were refrigerated containers. The loads ranged in size from about 16.5 to 20.0 tons per van container shipment. Transit time from loading to unloading ranged from 14 to 17 days. Four varieties of watermelons were shipped, namely, F-1 Hybrid in the first shipment, and Charleston Gray, Crimson Sweet, and Jubilee in the last two shipments. The size of the melons ranged from 12 to 25 pounds.

All the melons were packed in corrugated fiberboard boxes, either on a mule train in the field or at a stationary packing platform.^{2/} Two types of fiberboard boxes were used: a regular slotted, double-wall corrugated fiberboard box in one shipment, and a part-telescope, single-wall corrugated fiberboard box in the other two shipments. The double-wall fiberboard box was set up by folding the bottom flaps of the sides and ends inward and then stapling them together.

After the melons were packed in these boxes, the top flaps of sides and ends were folded inward and stapled together. The single-wall fiberboard box was constructed by folding the flaps of each side inward and then taking the flap of the bottom and folding upward and then downward over the two side flaps. This gave four thicknesses of single-wall fiberboard at each end of the box.

The top of the single-wall box was a part-telescope cap, 3 inches in depth. Dividers were placed between the melons in each of the two types of boxes. Depending on the number of melons in each box, two to four dividers were used. In two of the shipments, the boxes of melons were palletized on wooden pallets, and in the other shipment, the boxes were hand stacked on the floor of the van container.

^{2/} More information concerning the development of corrugated fiberboard boxes can be found in a report titled, "Comparative Methods of Handling Watermelons—Bulk and Cartons;" Market Analysis Series MA 1-71 by Elmer G. Close and Jack Varick, Florida Department of Agriculture and Consumer Services, and Lawrence A. Risse, U.S. Department of Agriculture, Transportation and Facilities Research Division, January 1971.

Ryan recorders were placed in each shipment to record temperatures. Pulp temperatures also were taken at the time of loading and unloading. Transport and handling costs associated with making the shipment were recorded. Product and box damage was also observed at the time of unloading and in the retail stores. Handling of melons from chainstore warehouse to retail stores was observed. Consumer reaction was observed at the retail stores.

RESULTS

Transport and Handling Charges

It cost approximately 5.29 to 5.70 cents per pound to deliver melons from Florida through a broker to a chainstore warehouse receiver in England (table 1). The cost per pound varied with the number of pounds loaded in the van container. Freight charges represented the largest cost factor for exporting watermelons. The ocean freight for the three experimental shipments was \$900 per van container load, or 2.28 to 2.68 cents per pound of watermelons.

Inland freight from Florida to Norfolk, Va., was \$750, or 1.90 cents per pound for the first shipment which was trucked; and \$431.63 per van container, or 1.29 and 1.21 cents per pound for the second two shipments via piggyback movement. Shipping from a port closer to Florida could reduce the inland freight charges substantially. At the time of this study, Norfolk, Va., was the closest port to Florida with direct container-ship service to European ports. Since this study was initiated, the port of Charleston, S.C., has initiated direct container-ship service to European ports, thus reducing inland freight charges.^{3/} In England, inland freight from Tilbury to Maidstone was \$81.60 per van container.

The import duty for watermelons in England was 5 percent of the value at the port of entry. The value of watermelons at port of entry includes f.o.b. price, inland freight in the United States, ocean freight, and insurance. Other charges for customs, importer's handling, and commission raised the total charges for transport and handling to 5.70, 5.55, and 5.29 cents per pound for the three shipments. The receiver paid 10.8 cents per pound for the watermelons and sold them at retail stores for the equivalent of approximately 15 cents per pound. The markup of 4.2 cents per pound between receiver's warehouse cost and consumer price is for distribution, slicing, and selling watermelons.

^{3/} Generally, for competitive reasons, the North Atlantic and South Atlantic (South Carolina to Miami, Fla.) oceanic freight rates are approximately the same. Because of distance from the Continent, gulf ports have higher rates. Selection of transport routes and comparisons of inland and overseas freight rates must be determined by the particular needs of the distributor.

TABLE 1.--Transport and handling charges for the three van container shipments of watermelons from
Florida to England, 1971 1/

Item	: First shipment		: Second shipment		: Third shipment	
	: Per load : Per pound		: Per load : Per pound		: Per load : Per pound	
	<u>Dollars</u>	<u>Cents</u>	<u>Dollars</u>	<u>Cents</u>	<u>Dollars</u>	<u>Cents</u>
Inland freight-----	2/ 750.00	1.90	2/ 431.63	1.29	3/ 431.63	1.21
Domestic insurance-----	--	--	19.50	.06	19.50	.05
USDA inspection-----	16.00	.04	16.00	.05	16.00	.05
Ocean freight-----	4/ 900.00	2.28	4/ 900.00	2.68	4/ 900.00	2.53
Ocean insurance-----	18.58	.05	18.58	.06	18.58	.05
Import duty 5/-----	172.99	.44	218.01	.38	131.55	.37
Inland freight-----	81.60	.21	81.60	.24	81.60	.23
Customs entries-----	10.89	.03	10.89	.03	10.89	.03
Handling charges-----	40.32	.10	36.94	.11	41.47	.12
Importer's commission 6/	255.90	.65	217.44	.65	230.56	.65
Total transport and handling charges-	2,246.28	5.70	1,860.59	5.55	1,881.78	5.29
Wholesale value-----	4,264.92	7/ 10.8	3,623.94	7/ 10.8	3,842.64	7/ 10.8
Gross return to shipper 8/	2,018.64	5.1	1,763.35	5.2	1,960.86	5.5

TABLE 1 (continued)

1/ The weight of melons in each of the three shipments was: No. 1, 39,490; No. 2, 33,555; and No. 3 35,580 pounds.

2/ Overland truck freight from LaBelle, Fla. to Norfolk, Va.

3/ Rail piggyback freight for a paired shipment from central Florida to Norfolk, Va.

4/ A negotiated 1971 charge for watermelons shipped in either ventilated or refrigerated van containers.

5/ Import duty calculated at 5 percent of value at port of entry—based on current f.o.b. prices of watermelons in Florida plus transport costs to the port. F.O.B. prices used were 4.5 cents for the first shipment and 3.5 cents for the second and third shipments.

6/ Importer's commission calculated at 6 percent of sale value to receiver. Wholesale value calculated at 10.8 cents per pound times the number of pounds in each shipment.

7/ Number has been rounded off for uniformity.

8/ The gross return to the shipper does not include allowances for losses due to damage during shipment or watermelons used for test samples given to retail store customers. On the first shipment, less than 2 percent of the melons were damaged on arrival at the retail store, and 5 percent of the melons were used for samples. On the next two shipments combined, approximately 18.4 percent of the melons were damaged on arrival at the retail stores, and approximately 1.5 percent of the melons were used for retail store samples.

Temperatures

One of the objectives of the study was to evaluate the use of an experimental forced-air, waterproof ventilation system on a van container (fig. 1).



Figure 1.--Ventilated van container on arrival in England, 1971. Note the four air intakes in front and the exhaust blower on open rear door.

The forced-air ventilated van container had four air intakes along the top of the front wall and two motor and exhaust blower sets on the rear doors to draw the air through the load.^{4/}

At the time of loading the ventilated van container, outside air temperature was near 100° F., and melon temperature ranged from 88° to 92° . After loading, the shipment was hauled by truck to Norfolk, Va., for loading aboard a container ship bound for England. The average temperature inside the load decreased from 100° at loading to 58° on arrival in England (fig. 2). Melon temperature on arrival ranged from 56° to 62° . The average temperature of the melons followed the path of the temperature of the outside air entering the van container.

The other two van container shipments were refrigerated. Watermelon temperatures at the time of loading were between 85° and 92° F., and on arrival ranged from 62° to 68° . The thermostat on each of the refrigerated van containers was set at 60° . The average temperature in the center of each load reached 70° within 4 days after loading.

^{4/} More information concerning the development of a waterproof ventilation system for van containers is forthcoming in a report being published by U.S. Department of Agriculture, ARS, titled, "Waterproof Marine Ventilation System for Dry Freight Van Containers," by Albert Biales, William F. Goddard, Jr., and Thomas Moffitt, all of Transportation and Facilities Research Division.

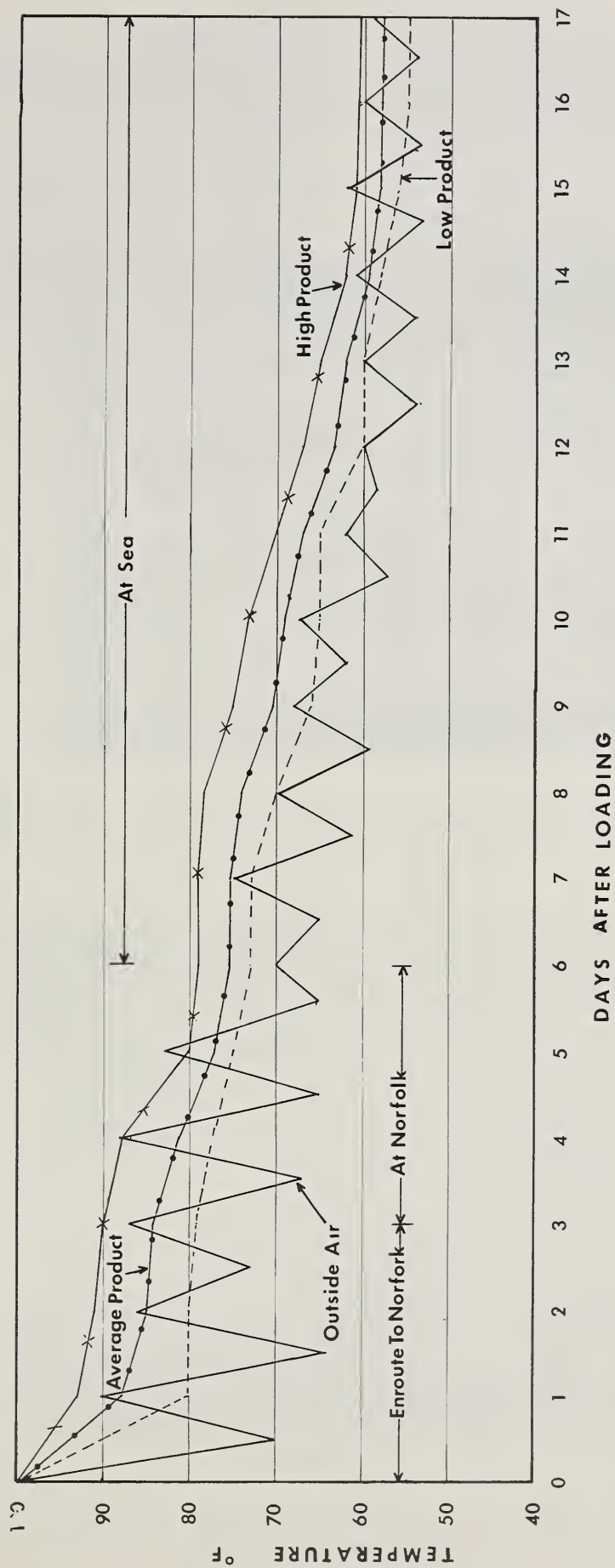


Figure 2.--Temperatures of watermelons in a ventilated van container in shipping test from Florida to England, 1971

Arrival Condition of Watermelons

The arrival condition of the first palletized load of F-1 Hybrid watermelons in the ventilated van container was excellent (fig. 3). Less than 2



Figure 3.--Arrival condition of first palletized load of watermelons in England, 1971. Note that boxes on pallets, bracing, and strapping are intact.

percent of the melons were damaged upon arrival at the retail store, and 5 percent of the melons were used for sampling by retail-store customers. The bracing at the rear of the load and between pallets was intact upon arrival. The corrugated fiberboard boxes used in this load were of double-wall construction and arrived in good condition except for some slight bulging of lower layer boxes because of overhead weight.

Arrival condition of the two refrigerated loads of watermelons, one palletized and the other hand stacked in the van containers, was not as satisfactory as that of the first load (figs. 4 and 5). In the palletized load, bracing between pallets was not adequate. The single-wall fiberboard boxes did not perform as satisfactorily as the double-wall fiberboard boxes (fig. 6).

The boxes showed considerable bulging and crushing from overhead weight. As the boxes crushed during transit, the pallet stacks leaned and shifted, making it impossible to unload many of the palletized units intact at destination. Many of the boxes in these two shipments contained Charleston Gray watermelons, which did not fit the box properly. In many boxes, the melons were 2 and 4 inches from the tops of the boxes.

Approximately 18.4 percent of the watermelons were unsalable upon arrival at the retail store. Much of this loss can be explained by the fact that the Crimson Sweet and Jubilee varieties were overmatured, and internal flesh was



Figure 4.--Arrival condition of second palletized load of watermelons in England. Note that boxes have shifted on pallets, and some of the strapping and bracing have also failed.



Figure 5.--Arrival condition of non-palletized load of watermelons in England. Note the crushed boxes in the lower layers.



Figure 6.--Typical example of lower layer, single-wall fiberboard box on arrival in England. Note the box crushed from overhead weight.

soft on arrival. At the time of loading, it was noted that these melons were more mature than those of other varieties that had been shipped.

Trade and Consumer Acceptance

Generally, the receiver of the watermelon shipments was pleased, preferring that all shipments be palletized because his distribution system from warehouse to retail store is completely palletized. He also preferred that the weight of watermelons be marked on each box. The receiver weighed each box of watermelons before distribution to retail stores. In the last two shipments, because of excessive damage to boxes and watermelons, some boxes were repacked before distribution. This rehandling, most likely, caused additional damage to melons.

The watermelons were displayed at the retail stores, whole and in halves, quarters, eighths, and in some instances, in smaller units, and wrapped with cellophane (figs. 7 and 8). Very few were sold whole.



Figure 7.--Typical display of watermelons at a retail store, London, England. Note the promotional material.



Figure 8.--Display featuring watermelons at a retail store, London, England. Note consumer interest in watermelon quarters wrapped in cellophane.

Consumer reaction to the watermelons was very good, because of the good condition and the size and general uniqueness of the fruit. Consumers reacted very favorably to the taste of these watermelons. Most European consumers are familiar with watermelons, but not with the U.S. varieties on display. Some consumers preferred the taste of the F-1 Hybrid, while others expressed no preference. Comments such as "delicious," "juicy," and "unusual flavor" were volunteered by many customers. The retail price was sixpence per pound. This

sum represented the British equivalent of approximately 15 cents in U.S. currency. At this price, the watermelons were competitive with other dessert-type fruits on display.

CONCLUSIONS AND RECOMMENDATIONS

The arrival of these three van container shipments showed that there is a definite market potential for exporting good-quality watermelons to England and, perhaps, to other European countries as well. However, the melons must be of high quality, not overmature, and packed in a fiberboard box of sufficient strength to protect the melons in transit. Palletizing and weighing each box of watermelons was requested by the receiver of these shipments. Other receivers may not want their shipments palletized, but U.S. shippers should comply with the requests of the receivers, as long as the receivers are willing to pay for added services. Retailers should be encouraged to sell melons, sliced or cut, because European consumers are accustomed to buying small quantities at a time.

From the beginning of the U.S. watermelon season, which occurs approximately April 15 in Florida and Texas, until July 1 (and perhaps later, depending on season, both in the United States and in other watermelon-exporting countries), the market for watermelons in England and possibly in other northern European countries such as the Netherlands, Germany, Sweden, etc., is good, because competition from other watermelons or other types of melons is relatively light. In southern Europe, harvest of watermelons and other types of melons does not begin until July 1. Other watermelons or melons are imported from Africa and South America during Europe's off-season.

During the early part of the watermelon season (April and May, when the temperatures are cooler), a forced-air, waterproof, ventilated system for shipping watermelons in van containers will be feasible as soon as this equipment becomes available. The forced-air, waterproof, ventilated van container developed by ARS should become available within a year or two as modifications of existing equipment are made by van container owners or manufacturers. However, in the meantime and during warmer weather, refrigerated van containers should be used. If at all possible, the van containers should be loaded at the shipping point and unloaded only at final destination. This practice would not only reduce handling costs, but also eliminate much of the physical damage that normally occurs during loading and unloading operations.

In this study, through an importer it cost between 5.29 and 5.70 cents per pound to export watermelons from Florida to a retail chainstore warehouse in England. The cost of exporting will vary, depending on the charges for (1) inland freight in the United States and in the foreign country, (2) the amount of the import duty, and (3) the importer's handling fee.

The import duty to England in 1971 was 5 percent of value at port of entry. The import duty to European Economic Community (EEC) countries as of

January 1, 1972 was 11 percent.^{5/} Generally, when the f.o.b. price for boxed watermelons falls to approximately 5 cents per pound in the United States, shippers may want to consider foreign markets--assuming that the final receiver is willing to pay 10.8 cents per pound.

There are certain recommendations that shippers should follow if they are to build and maintain a good export market:

1. Ship only high-quality watermelons.
2. The melons should be placed in fiberboard boxes designed to withstand long transit periods.
3. The melons should fit the fiberboard boxes exactly. A box that is 2 or 3 inches deeper than the height of watermelons in the box permits stacked boxes to be crushed from overhead weight. Perhaps, boxes of varying heights should be used for different sizes of watermelons. Other methods of shipping watermelons, such as bulk or pallet bin, should be used only on an experimental basis in cooperation with the importer until such methods have proved successful.
4. If the boxes of watermelons are to be palletized, adequate strapping and bracing between the pallets are essential. Bracing of either nonpalletized or palletized loads at the rear of the van container is also essential to fill any void between the load and the rear doors of the van containers. Bracing helps to prevent shifting of boxes during transit which otherwise might cause damage to the boxes and watermelons.
5. All boxes of watermelons should be placed on their bottoms, and not on their sides or ends.
6. Since the watermelons will be sliced at the retail level, larger melons may be better for export.

Research is needed to determine if watermelons can be exported to other European countries. More research is also required to determine the following:

1. Proper loading patterns for unitized and nonunitized shipments in ventilated and refrigerated van containers.
2. Proper bracing methods for unitized shipments.
3. The possibility of exporting watermelons in bulk or pallet bins.

^{5/} The United Kingdom, Norway, Denmark, and Ireland (Eire) signed a treaty of accession, subject to ratification, on January 22, 1972, leading to formal entry into the Common Market effective January 1, 1973. Between April 1, 1973, and July 1, 1977, differences between the United Kingdom and the European Community in agricultural import duties affecting watermelons are to be equalized in five proportionate steps. This would foreshadow an increase in import duties to England in 20-percent increments annually.